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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,106	02/12/2002	Tsuyoshi Yamamoto	020154	3709
38834	7590	02/09/2006	EXAMINER	
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036			KIM, PAUL D	
			ART UNIT	PAPER NUMBER
			3729	

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/073,106

Applicant(s)

YAMAMOTO ET AL.

Examiner

Paul D. Kim

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

This office action is a response to the restriction requirement filed on 10/06/2005.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hikita et al. (US PAT. 6,113,637) in view of Kobayashi et al. (JP 57188833 A).

Hikita et al. teach a process of mounting electronic component comprising steps of: placing an electronic component (16) on a substrate (14) with a solid support (24, anisotropic conductive film) interposed between the electronic component and the substrate so as to space a terminal conductor (16b) of the electronic component from a corresponding terminal pad (14c) on the substrate; and melting the solid support so as to move down the electronic component toward the substrate, thereby contacting the terminal conductor with the conductive bonding material melting on the corresponding terminal pad as shown in Figs. 7 and 8 (see also col. 5, line 61 to col. 6, line 19).

However, Hikita et al. do not teach melting the conductive bonding material on the terminal pad prior to contact the terminal conductor with the conductive bonding material. Kobayashi et al. teach a connecting method such that a conductive bonding

material (2) is heated to be the melted conductive bonding material (5) before the material to be connected as shown in Figs. 1-2 in order to improve the strength of bonding between the electronic component and the substrate (see also abstract).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a mounting process of Hikita et al. by melting the conductive bonding material on the terminal pad before the material to be connected as taught by Kobayashi et al. in order to improve the strength of bonding between the electronic component and the substrate.

As per claim 2 the anisotropic conductive film used as the solid support of Hikita et al. is made of epoxy resin containing metal particles such as resin ball plated with nickel or gold and the conductive bonding material is made of solder. In the manufacturing of the electronic component, the anisotropic conductive film containing metal particles such as resin ball plated with nickel or gold height has a higher melting point than the solder material, which is well known in the art. At the time the invention was made, it would be also an obvious matter of design choice to a person of ordinary skill in the art to use the material such as thermoplastic resin having a high melting point as recited in the claimed invention because Applicant has not disclosed that the material as recited in the claimed invention provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with Hikita et al. because the material as recited in the claimed invention would perform equally well such as conductive film containing metal particles, which has a relative high melting point of

Hikita et al than solder material in Kobayashi et al. Therefore, it would have been an obvious matter of design choice to modify the conductive film containing metal particles of Hikita et al. to obtain the invention as specified in claim 2.

As per claim 3 the conductive bonding material comprises solder bump.

As per claim 4 the anisotropic conductive film used as the solid support is made of epoxy resin, which has an adherent property (col. 8, lines 54-56).

As per claim 20 the electronic component drops toward the substrate based on its weight (equivalent with compressing) in response to melting of the solid support.

Response to Arguments

3. Applicant's arguments filed 10/6/2005 have been fully considered but they are not persuasive. Applicant argues that the prior art of record fails to disclose the claimed invention such as a process of melting the conductive bonding material on the terminal pad prior to melting on the solid support. Examiner traverses the argument. Hikita et al. teach all of the limitations as set forth above, but fail to disclose whether the conductive bonding material is melted prior to melting the solid support. Kobayashi et al. teach that the conductive bonding material is formed and heated to be the melted the conductive bonding material before the component to be connected. Therefore, it would be obvious to modify the conductive bonding material of Hikita et al. by melting the conductive bonding material before the component to be connected as taught by Kobayashi et al. in order to improve bonding strength. In addition to that there is no such limitation to connect the terminal pad and the terminal conductor while the conductive bonding

material is in the melting stage. The conductive bonding material of Kobayashi et al. is placed on the terminal pad and then melted.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul D. Kim whose telephone number is 571-272-4565. The examiner can normally be reached on Monday-Friday between 6:00 AM to 2:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3729

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Paul D Kim
Examiner
Art Unit 3729